

REMARKS

By this amendment, the specification is amended to conform to the drawings, claim 1 is amended and new claim 14 is presented. Claims 1-14 are pending in the application. The drawings were objected to, claims 1-11 rejected as either anticipated by Murphy '090 or obvious in further view of Ramachandran and/or Castagnos, Jr. Claims 12-13 stand withdrawn from examination as drawn to a non-elected invention and the traverse of the restriction requirement was made final. Further examination of the application, as amended, reconsideration of the objections and rejections, reconsideration of the restriction requirement and/or rejoinder of claims 12-13, and allowance of all pending claims are respectfully requested.

In response to the drawing objections, the specification has been amended at paragraphs 36, 38, 42 and 45 to conform to the original drawings by deleting reference to numeral 460 and inserting numerals 129, 184 and 404 with appropriate text for grammatical purposes. Inasmuch as the drawings form a part of the original specification and/or the features were implicit in the original text, the present amendment does not present any new matter. It is thus believed that the drawing objections are overcome and can be withdrawn.

The amendment to claim 1 clarifies that the radial slot, for introducing the catalyst and fuel mixture from the annulus into the dense phase bed below the upper surface of the bed, is disposed below the upper surface of the bed. The scope of the claim is unchanged and thus no new matter is introduced. New claim 14 recites that the radial slot (206) is formed between a top end of the centerwell pipe (204) and an annular plate (208) about the standpipe portion (118), to direct the fluidized catalyst/fuel mixture radially outwardly, as shown in Fig. 2 and described in paragraph [0038]. No new matter is presented.

The claims of the present invention are directed to a regenerator for catalyst used in an FCC process wherein insufficient coke or heavy hydrocarbons are deposited on the catalyst to support regeneration. Supplemental fuel is introduced into the spent catalyst feed at the bottom of a standpipe entry into a centerwell, and the mixture is fed out of the centerwell through a radial slot into the dense phase catalyst bed below the top surface of the catalyst bed. In this manner, the supplemental fuel is mixed with the spent catalyst and kept in the catalyst bed, thus providing heat for the catalyst regeneration upon combustion with the oxygen-containing gas (air, c.g.) that is introduced into the bottom of the catalyst bed below the slot, and minimizing the risk of combustion of the fuel above the

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catalyst bed and/or uneven heating. See the specification at paragraph [0039].

It is respectfully submitted that the primary reference, Murphy '090, does not anticipate claim 1 as asserted in the office action. First of all, claim 1 requires both a fuel distributor and a fluidization gas distributor within the centerwell, in addition to the oxidizing gas introduced to the bottom of the catalyst bed outside the centerwell. Murphy '090 discloses only a single steam injection ring 20, and does not teach or suggest the fuel distributor recited by applicant. Even if the steam injection ring could be (and there is no evidence or support in the office action of the equivalency of fluidization gas and fuel oil distributors) and were to be used for the fuel injection as asserted in the office action, then Murphy '090 would not have the second distributor additionally recited for fluidization gas in claims 1-11 and 14. Furthermore, Murphy '090 fails to provide any motivation or guidance for such a proposed modification.

Secondly, Murphy '090 distributes the spent catalyst feed from an open upper end of the well pipe 18 via trough arms 26 onto the top of the catalyst bed. See (column/lines) 3/40-50. There is no circular slot disposed below the top of the catalyst bed to introduce any fuel/catalyst mixture below the top of the catalyst bed. According to vernacular lexicography, a

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“slot” would be understood as a relatively narrow passage, and would not read on an open-top centerwell. Murphy ‘090 thus does not have the recited structure necessary in applicant’s claimed invention for this purpose, and would not achieve the even heating of the catalyst bed. It appears instead that introduction of fuel into the centerwell of the Murphy ‘090 device would result in the potentially dangerous situation where the fuel and oxidant gas would mix at or above the top of the catalyst bed where any combustion would not heat the catalyst bed very well if at all. Murphy ‘090 simply would not fulfill the new function provided by the structure of applicant’s claimed regenerator.

The requirement for the radial or circular slot in applicant’s device is also emphasized in new claim 14.

Claims 2-11 depend from claim 1 and thus can also be similarly distinguished from Murphy ‘090. The secondary references, Ramachandran and Castagnos, Jr., fail to bridge the gap between Murphy ‘090 and the claimed invention. Ramachandran is cited only for the use of fuel for heating the catalyst at startup or non-steady state conditions and is thus at best cumulative to applicant’s acknowledgement of this prior art at paragraph [0005]; but Ramachandran fails to teach or suggest the presently claimed apparatus wherein the spent catalyst feed is pre-mixed with the fuel

via a second distributor in the centerwell and introduced mid-bed into the dense phase bed of catalyst in the regenerator via a radial centerwell slot for even catalyst heating suitable for steady state operation when the spent catalyst is continuously insufficiently coked to sustain regeneration.

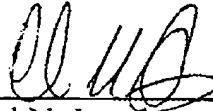
Castagnos, Jr. is cited only for its disclosure of an angled spent catalyst entry into the regenerator that terminates at a vertical standpipe without a centerwell. Castagnos, Jr. thus also fails to teach or suggest the presently claimed apparatus wherein the spent catalyst feed is pre-mixed with the fuel via a second distributor in the centerwell before being introduced into the dense phase bed via a radial centerwell slot.

Finally, applicant requests further reconsideration of the restriction of claims 12 and 13 and/or rejoinder of these claims. Claim 12 recites all of the features of claim 1, because it depends from claim 1; claim 13 recites each of the distinguishing features of claim 1, e.g., the fuel distributor, radial slot, mid-bed positioning of the slot for introduction of the spent catalyst feed-fuel mixture into the catalyst bed, as well as the specific slot features of claim 14. Therefore, these claims are allowable over the art for the same reason as claims 1-11 and 14 and no searching is required for the examination thereof.

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Withdrawal of the objections, rejections and the restriction requirement, and allowance of all pending claims, are respectfully requested. Should any issues remain that are appropriate to resolution by telephone interview, please contact undersigned counsel.

Respectfully submitted,



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